

AD-401 44/2

# TECHNICAL MEMORANDUM

(TM Series)

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Modification Of SVPAS And  
SNPAS For SPACETRACK Data  
by  
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Approved  
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20 March 1963

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The pass programs for VTS and NBTS have had added to them the capability to use as input the Local Tracking paper tape output by SPACETRACK in lieu of a binary transfer tape from the PREPASS program. The purpose of this is to test the thesis that SPADATS Look Angle data can be used to support a pass at a tracking station for Program 417 vehicles.

The mode of operation is to use SVPAS (or SNPAS) with the proper function card options (see attached operating instructions) and the SPADATS paper tape. Differences in operating procedures (from the usual operation) are as follows:

1. PREPASS and POSTPASS functions are not used.
2. Tapes 4 and 8 are not used by the pass program.
3. At some time before the pass, the SPADATS paper tape is read in. The pass program will, under the SPADATS option, read the tape and halt when the tables of antenna driving data are set up (this process requires about 5 minutes with good tapes and clean reader).

The SPADATS paper tapes should be listed on a teletype machine to check for gross errors: the time should be right for today's pass, the rev corresponding with that on the function card should appear on the tape, the station number should be correct; there should be no errors on the tape (see attached format). After the pass program has read in the paper tapes, a listing is produced (on-line) of the angles, slant range, and times as found on the tape; this should also be inspected for credibility.

Symbolic and Binary decks of the programs are available, and both versions of the pass programs have been checked out at the CPDC in the simulation mode.

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Appendix A

A. Format of SPADATS paper tape as it appears on a teletypewriter.

1. First portion is informational header which is not used by the program.
2. Next, four lines of page header followed by the ephemeris:

NEW BOSTON 886 62A-OMICR1 SAT. NO. 369 ELEM 11 SEC. 16  
COMPUTATIONS STARTED AT REVOLUTION NO. 2738 ALL PASSES

REV	ZEBRA	TIME	ELEV	AZIM	RANGE
NO.	DAY	HR MIN.	ANG.	ANG.	KM.
2752	60	19 10.72	. .0	141.6	2480
2752	60	19 10.77	. .2	141.4	2460

et cetera

2752 60 19 14. 87 28.1 101.9 1071

CONTINUED

3. Next page (new tape)

NEW BOSTON 886 62A-OMICR1 SAT. NO. 369 ELEM 11 SEC. 17  
COMPUTATIONS STARTED AT REVOLUTION NO. 2738 ALL PASSES

REV	ZEBRA	TIME	ELEV	AZIM	RANGE
NO.	DAY	HR MIN.	ANG.	ANG.	KM.
2752	60	19 14.92	28.5	100.7	1061

et cetera, for as many tapes as are necessary to  
complete the pass (usually a total of three)

## B. Explanation:

886 (or 989) A search is made for one of these station numbers near the beginning of a line. Once one is found, a check is made for correct station.

62A-through ELEM xx Not interpreted by the program

SEC.16(17,18, ....) Used to check proper sequence of tapes read in. This is the section number to which the on-line typewriter refers in the message, "xx SHOULD BE THE NEXT SECTION READ IN"

## COMPUTATIONS STARTED

AT ..... PASSES Not interpreted by the program

Column Headings Not interpreted by the program

Ephemeris The time is set up from the first line, then incremented within the program; the angles are read in and used from each line; the range is not used. The ephemeris is terminated by rev number changing or by operator action. The ephemeris for the desired rev need not start at the beginning of a tape, that is, parts of more than one pass may be included on one section of paper tape.

Appendix BOPERATION OF THE VAFB OR NBTS PASS PROGRAM USING SPADATS PAPER TAPE AS INPUT**I. MACHINE SETUP****A. Tapes (1607 Cabinet #2)**

1. GTM
2. (Not Used)
3. Listable output
4. (Not Used)

**B. Tapes (1607 Cabinet #3)**

5. (Not Used)
6. Binary Rec. of track (tape #2)
7. Binary Rec. of track (tape #1)
8. (Not Used)

**C. Card Reader**

1. For the time being, until these programs are re-defined as programs-to-be-used-a-lot, usage will be via binary deck. The decks will be installed on a master tape whenever desired.

2. The function card format is as follows:

\*SVPAS (or SNPAS) parameter parameter etc.<sup>1</sup>

3. The parameters (options) may be punched or typed in any order but must be separated by a blank space.
4. Any parameters (options) not specified in the calling sequence will be considered normal.

**D. Parameters (options)**

SPADATS            Use SPADATS paper tape for input. When this parameter is present, so must the next two also be.

REV xx            xx is the rev number for this pass (it must be integral, and must follow REV and be separated from it by a blank).

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<sup>1</sup> SVPAS is to be used at VAFB; SNPAS at NBTS

vvvv	Vehicle number (integral).
CARDS	Read cards on-line. This option is used strictly for checkout and should not be used operationally.
TS	Time shift
SIM	Simulate track
NINT	No interrupt. Not used operationally.
NTAPE	Do not write binary rec. of track
NPR	No on-line printout
NPICE	Do not use PICE

### II. OPERATION

- A. Ready PICE. Ascertain that there is a valid PICE program load.
- B. Ready printer.
- C. Ready card reader with binary deck and function card, and if applicable, correctors.
- D. Ready paper tape reader with first section of SPADATS tape for the desired rev. Be sure that the reader is clean.
- E. Start at location 10 to: call in program with desired options, read the paper tapes, and print out SPADATS Angles, time, and slant ranges (as taken from the paper tapes) followed by the heading.
- F. After heading prints, computer will stop. At this time, ascertain that interrupt is turned on (Exception: during checkout if using the NINT option, the interrupt will not be turned on.) In addition, check the SPADATS Angles printout to make sure that no wild deviations from normal occur therein.
- G. Hit start to begin track.
- H. If it is desirable to terminate the pass program before the end of the ephemeris, hit the carriage return on the typewriter and type in: "stop+" for VAFB, "stop" for NBTS.

### III. CORRECTIONS

If it is necessary to read correctors to the pass program, the method used will be that outlined in SDC TM-745.

**IV. THE ON-LINE OUTPUT FORMAT IS AS FOLLOWS:****A. Before the pass (after set-up of SPADATS Angles is complete)**

DUR	META	REV	MON	DAY	HR	MIN	SEC	EL	AZ	SR/KM
.0	5166643.17	2752	3	1	19	10	43.2	.0	141.4	2480.
3.0										

etc.

5167341.17 METT

This printout is for the checking of the data after the paper tapes have read in.

**B. During the pass**

TIME	System time (seconds)
ETAT	Estimated time until arrival (before rise)(seconds)
	Estimated time to track (after rise)(seconds)
SY	Synch indicator
	Blank = synch
	S = out of synchronization
SJS	Status of selective Jump Switches
DEC	Declination input (degrees)
AZ	Azimuth input (degrees)
TR	0 (degrees)
LK	Status of lock-on
	L = locked-on
	Blank = Not locked-on
DEC	Declination output (degrees)
AZ	Azimuth output (degrees)
TR	0 (degrees)

**V. TYPEWRITER PRINTOUTS (BEFORE THE PASS)**

1. PUT READER IN CHARACTER MODE AND HIT START
2. REV. NOT ON TAPE LOAD ANOTHER TAPE AND HIT START

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(Last page)

3. BUFFER FULL HIT START TO PROCESS WHAT YOU HAVE
4. CANNOT FIND STATION NO. LOAD NEW TAPE, HIT START
5. WRONG SECTION ORDER, LOAD RIGHT TAPE HIT START
6. XX SHOULD BE THE NEXT SECTION READ IN  
SET JUMP KEY 2 IF NO MORE TAPES ARE TO BE USED
7. ALL OF REV. READ IN HIT START TO CONTINUE
8. SPADATS ANGLES ARE SET-UP.  
HIT START TO CONTINUE PASS PROGRAM

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System Development Corporation,  
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MODIFICATION OF SVPAS AND SNPAS  
FOR SPACETRACK DATA.

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DESCRIPTORS: Programming (Computers).  
Satellite Networks.

Reports that the pass programs for  
Vandenberg Tracking Station (VTS)

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and New Boston Tracking Station (NBTS)  
now have the added capability to use  
as input the Local Tracking paper tape  
output by SPACETRACK in lieu of a  
binary transfer tape from the PREPASS  
program. Also reports that the purpose  
of this addition is to test the thesis  
that SPADATS Look Angle data can be  
used to support a pass at a tracking  
station for Program 417 vehicles.

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